

Claims

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1. A catalyst composition comprising at least one non-noble Group VIII metal component, at least two Group VIB metal components, and at least about 1 wt.% of a combustible binder material selected from combustible binders and precursors thereof, the Group VIII and Group VIB metal components making up at least about 50 wt.% of the catalyst composition, calculated as oxides.

10 2. The catalyst composition of claim 1 wherein the Group VIII and Group VIB metal components make up at least about 70 wt.% of the catalyst composition, calculated as oxides.

15 3. The catalyst composition of claim 2 wherein the Group VIII and Group VIB metal components make up at least about 90 wt.% of the catalyst composition, calculated as oxides.

20 4. The catalyst composition of claim 1 which consists essentially of at least one non-noble Group VIII metal component, at least two Group VIB metal components, and at least about 1 wt.% of a combustible binder material.

25 5. The catalyst composition of claim 1 wherein the Group VIII non-noble metal component comprises cobalt, nickel, iron, or mixtures thereof.

6. The catalyst composition of claim 1 wherein nickel and cobalt make up at least about 50 wt.% of the total of Group VIII non-noble metal components calculated as oxides.

30 7. The catalyst composition of claim 6 wherein nickel and cobalt make up at least about 70 wt.% of the total of Group VIII non-noble metal components calculated as oxides.

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8. The catalyst composition of claim 6 wherein nickel and cobalt make up at least about 90 wt.% of the total of Group VIII non-noble metal components calculated as oxides.

5 9. The catalyst composition of claim 1 wherein the Group VIB metal component comprises at least two of molybdenum, tungsten, and chromium.

10 10. The catalyst composition of claim 9 wherein molybdenum and tungsten make up at least about 50 wt.% of the total of Group VIB metal components, calculated as oxides.

15 11. The catalyst composition of claim 10 wherein molybdenum and tungsten make up at least about 70 wt.% of the total of Group VIB metal components, calculated as oxides.

20 12. The catalyst composition of claim 10 wherein molybdenum and tungsten make up at least 90 wt.% of the total of Group VIB metal components, calculated as oxides.

25 13. The catalyst composition of claim 1 wherein the combustible binder material is a combustible binder or a combustible binder precursor which, for the combustible binder precursor optionally after pyrolysis, comprises carbon as its major component.

30 14. The catalyst composition of claim 13 wherein the combustible binder material is or is derived from a combustible binder precursor which comprises an organic polymer selected from the group of polyacrylonitriles, bakelite, polyamides, polyurethanes, cellulose and derivatives thereof, hemicellulosic materials, polyfurfuryl alcohol, styrene-divinylbenzene copolymers, phenol resins, furan resins, polyimide resins, polyphenylene resins, phenolic foams, and polyurethane foams.

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15. The catalyst composition of claim 1 wherein at least part of the metal components is in the sulfided form.

5 16. A process for preparing a catalyst composition according to claim 1 which process comprises contacting at least one Group VIII non-noble metal component with at least two Group VIB metal components in the presence of a protic liquid, wherein a combustible binder material selected from a combustible binder or a precursor thereof is added prior to, during and/or 10 subsequent to the contacting of the metal components.

17. The process of claim 16 wherein contacting of the metal components comprises combining and reacting the metal components in solution to form a precipitate.

15 18. The process of claim 16 wherein contacting of the metal components comprises combining and reacting the metal components in the presence of a protic liquid, with at least one of the metal components remaining at least partly in the solid state during the entire process.

20 19. The process of claim 16 wherein the combustible binder material comprises a precursor of a combustible binder and the precursor is converted into a combustible binder after addition.

25 20. The process of claim 19 wherein the precursor of the combustible binder is converted into the combustible binder by pyrolysis in an inert atmosphere at a temperature in the range of about 300°-600°C.

21 21. The process of claim 1 which includes a sulfidation step.

17. A process for the hydroprocessing of hydrocarbon feedstocks wherein the catalyst composition of claim 1 is contacted with said hydrocarbon feedstocks at hydroprocessing reaction conditions.

18. A process for the recycling of a used or waste catalyst composition comprising a Group VIII non-noble metal, a Group VIB metal, and a combustible binder, wherein the catalyst comprises at least about 1 wt% of carbon as part of the combustible binder, based on the total weight of the catalyst composition, which process comprises thermally treating the used or waste catalyst composition in an oxygen-containing atmosphere at a temperature of at least about 300°C.

19. The process of claim 18 wherein the used or waste catalyst comprises at least one Group VIII non-noble metal component and at least two Group VIB metal components, the Group VIII and Group VIB metal components making up at least about 50 wt.% of the catalyst composition, calculated as oxides.

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